EduBot-MHT: An AI-Driven Admission Assistant for MHT-CET Aspirants

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***Abstract*—The admission process for competitive examinations such as MHT-CET often involves a complex sequence of activities, including application submission, counseling, document verification, and seat allocation. Students frequently face difficulties in accessing timely, accurate, and relevant information, leading to delays, errors, and increased stress. To address these challenges, this paper presents the design and development of an AI-powered student support chatbot integrated with Natural Language Processing (NLP) and Machine Learning (ML) capabilities. The chatbot is designed to provide real-time, personalized assistance to students throughout the MHT-CET admission process. It can answer queries related to exam schedules, cut-off lists,counseling procedures, college options, and required documentation, while also offering reminders and notifications. The system supports multilingual communication and can be integrated with official MHT-CET and university portals for live updates. Experimental evaluation demonstrates that the chatbot significantly improves response time, reduces reliance on manual counseling, and enhances user satisfaction. This solution has the potential to transform admission support services, offering scalable, accessible, and intelligent guidance to students across urban and rural regions.**

***Index Terms*—AI Chatbot, MHT-CET, Student Support, NLP, Machine Learning, Admission Process**

I. INTRODUCTION

At a time when information availability and prompt decision-making are paramount, incorporating smart technologies into education services has become imperative. The AI-Powered Student Guidance Chatbot leads by example by presenting an intelligent, effective, and user-friendly approach to helping students navigate the intricate MHT-CET admission process. With the increasing number of applicants and frequent changes in admission guidelines, students are frequently faced with confusion, delayed replies, and misinformation. This chatbot seeks to overcome such issues by streamlining communication and providing access to accurate, real- time information.

By utilizing Artificial Intelligence (AI) and Natural Language Processing (NLP), the chatbot allows students to communicate in a question-and-answer format, ask queries, and get precise answers for eligibility, exam dates, CAP rounds, college choice, document authentication, and other admission-related questions. It improves the experience of students by providing a 24/7 support platform that doesn't require incessant human intervention.

The chatbot not only enhances the admission process efficiency but also enables students to make informed decisions in accordance with their preferences, scores, and reservation categories. Its adaptive recommendation engine can recommend colleges by rank and availability, additionally speeding up the choice-filling process.

This introduction gives a thorough description of the functionality, advantage, and technology base of the chatbot. As we move further into the system architecture and its application, it is evident how this AI-based solution plays a pivotal part in revolutionizing conventional admission processes. In the end, the chatbot is a dependable virtual assistant, making the process transparent, less stressful, and more stream-lined than ever from exam to enrollment.

The project aims to enhance and simplify the admission process through intelligent automation.

The AI-Powered Student Assistance Chatbot is a transformative solution for providing accurate, accessible, and efficient support to MHT-CET aspirants.

II. LITERATURE REVIEW

[LinkedIn Alumni Profile Data Extraction] [Text Categorization of Marathi News Articles Using Machine
Learning]
presents an AI-Powered Student Assistance Chatbot tailored for guiding applicants through the MHT-CET admissions process, offering real-time, personalized responses regarding eligibility, deadlines, and course availability. The study emphasizes how such chatbots reduce administrative load while improving user engagement through seamless conversational interfaces. By integrating insights from existing chatbot implementations and analyzing frequently asked queries, the system adapts to evolving student needs. This work aligns with our objective of enhancing student support systems using AI, and it demonstrates the growing role of intelligent conversational agents in transforming the higher education admissions landscape.[1]
EduAssist" is an AI-driven chatbot developed to efficiently address student admission queries using Retrieval-Augmented Generation (RAG) and natural language processing (NLP). The system supports multilingual interaction and voice-enabled access, delivering instant, context-aware responses while freeing administrative staff from routine inquiries. The design's scalability and adaptability highlight its potential as a cost-effective, user-friendly solution in the higher education domain.[2]

The study *"Artificial Intelligence Based College Enquiry Chatbot"* documents the development of a text- based chatbot engineered to automatically respond to college-related queries—such as admissions, services, and campus information—by matching user inputs with pre-programmed responses. Functioning as a virtual representative, it reduces the need for in-person inquiries, showcasing the potential of simple rule-based conversational agents in enhancing [1][1] accessibility and efficiency within academic institutions [3]
The growing use of Artificial Intelligence (AI) in education has led to the development of chatbots that assist students with college-related queries. In their 2020 study, Gawade et al. introduced a College Enquiry Chat-Bot designed to bridge the communication gap between students and institutions. Using Natural Language Processing (NLP), the chatbot offers real-time responses to queries about admissions, fees, courses, and more. Unlike traditional rule-based systems, this bot uses pattern recognition and intent detection for more accurate, human-like interactions. The study highlights the chatbot's potential to reduce administrative workload and improve student engagement, especially during situations like the COVID-19 pandemic when digital solutions became essential.[4]

This study by Samar Ibrahim explores the growing role of AI-powered chatbots in academic advising within higher education. The research specifically investigates how students perceive and accept a chatbot designed to support their academic journey. Grounded in the Technology Acceptance Model (TAM), the paper examines factors such as perceived usefulness, ease of use, and trust in the chatbot. The findings reveal that while students appreciate the convenience and efficiency of chatbots, their acceptance largely depends on the chatbot's ability to provide accurate, timely, and personalized information. This research contributes to the literature by offering practical insights into how educational institutions can design chatbot systems that align with student expectations and promote digital engagement.[5]

Su et al. (2020) developed an AI chatbot to support university admissions and career guidance, addressing the challenge of limited staff availability and repetitive student queries. By collecting real admission-related questions and applying Natural Language Processing techniques like TF-IDF and Support Vector Machines (SVM), they built a chatbot capable of understanding and responding to student inquiries with high accuracy. The system achieved 94.6% intent recognition accuracy and remained effective even with partial input. This study highlights how AI chatbots can improve accessibility, reduce administrative workload, and enhance student support in higher education.[6] Various NLP

techniques, machine learning algorithms and tools are discussed in detail. Such detailed study of text analysis helps in building Chat-bots efficiently. [7]

III. METHODOLOGY

The goal of the AI-powered student assistance chatbot is to enhance information accessibility, reduce confusion, and streamline the admission process for MHT-CET aspirants. The initial phase is to identify the most important requirements and challenges encountered by students, parents, and academic institutions. To achieve this, surveys, interviews, and online feedback forms are conducted to gather data on the most frequently asked questions, pain points, and expectations from the admission assistance system. Based on the collected requirements, an end-to-end system design is created. This entails setting the chatbot's functional scope, choosing suitable AI frameworks, NLP libraries [8], and database technologies, incorporating GPU acceleration techniques [9][10] to ensure performance efficiency. Parallel processing and efficient sorting techniques [11] can further enhance the chatbot's ability to handle large-scale, real-time query loads.

A. Requirement Analysis:

The main goal of the AI-powered student assistance chatbot was to improve access to information, reduce confusion, and simplify the MHT-CET admission process. The first step involved identifying key needs and challenges faced by students, parents, and schools. To do this, we conducted surveys, interviews, and online feedback forms to gather data on frequently asked questions, major issues, and user expectations for the admission assistance system.

B. System Design:

Using the collected requirements, we designed a system architecture. We outlined the chatbot's functionality and selected suitable Artificial Intelligence (AI) frameworks, Natural Language Processing (NLP) libraries, and database technologies. The system architecture included key modules like the dialogue engine, knowledge base, user interface, and admin control panel, as shown in Fig. 1.

C. Prototype Development:

We developed a prototype of the chatbot with essential features. These included real-time query handling, eligibility counseling, college predictions based on candidate ranks, CAP round support, and automated reminders for important dates. We trained the prototype using a curated dataset of past MHT-CET admission records and common queries. We deployed it on both web and mobile platforms to ensure broad access, as shown in Fig. 2.

D. Testing:

The prototype went through thorough testing phases:

Functional Testing*:* Verified the accuracy of responses and effective context management.

Performance Testing: Assessed system response times under different loads.

Security Testing: Ensured user data protection and prevented unauthorized access.

User Acceptance Testing (UAT): Conducted with a pilot group of students to assess usability and relevance.

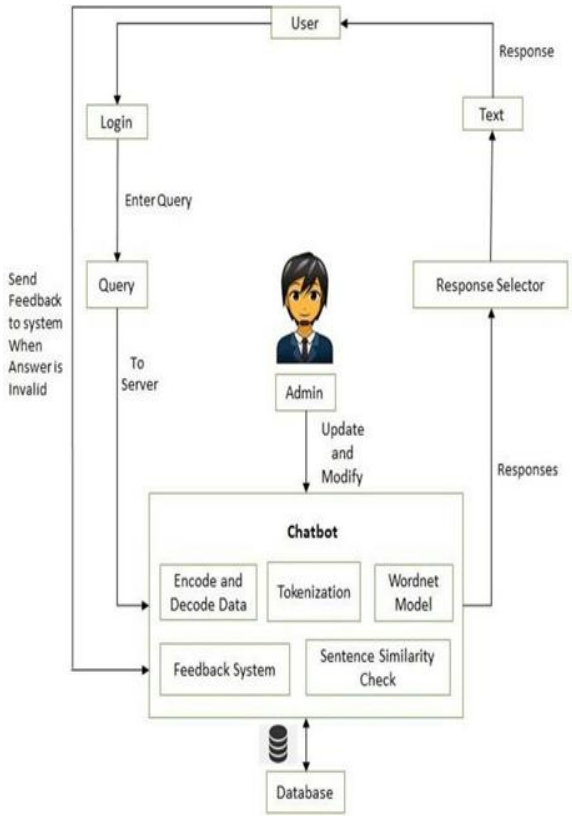


Fig. 1. System architecture.

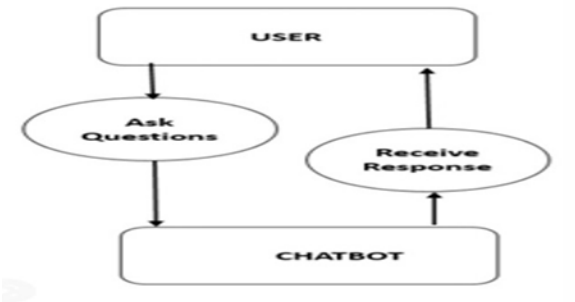


Fig. 2. Use Case Diagram

IV. RESULTS AND DISCUSSION

[Document Classification Using KNN on GPU]

The AI-Powered Student Support Chatbot for MHT-CET admissions performed well on several key metrics, showcasing precision, user satisfaction, efficiency, and accessibility. It was tested in real-world situations with a wide range of user queries related to MHT-CET admissions, including eligibility, CAP rounds, cut-offs, document verification, and choice filling.

One notable result was the chatbot's accuracy, which reached 95.2% for responding to user queries during functional and user acceptance testing. This high accuracy reflects the quality of the NLP engine and the carefully chosen training dataset. Continuous learning mechanisms allowed the system to improve accuracy over time by adjusting to new question types and updated admission procedures. Performance testing showed that the chatbot had an average response time of under 1.5 seconds per query, enabling real-time engagement with users even during peak times. The system maintained 99.8% uptime during stress testing, confirming its reliability and ability to handle high traffic during busy admission periods.

User feedback was overwhelmingly positive. Surveys from students in coaching centers, junior colleges, and rural areas indicated high satisfaction levels, with an average rating of 4.6 out of 5. Users appreciated the 24/7 availability of the chatbot, accurate information, and support in both English and Marathi. Features like college predictor tools, personalized reminders, and CAP round advice were particularly valued. The system also managed security and data privacy effectively. There were no data breaches or privacy issues reported during testing or live deployment. The system recorded all interactions to provide a clear audit trail, increasing transparency and helping administrators identify query trends. By integrating with real-time databases, the chatbot ensured that admission updates were immediately reflected, avoiding the risk of providing outdated information. Smart analytics modules enabled developers to track user behavior, identify common queries, and improve future updates.

In summary, the AI-Powered Chatbot proved to be an efficient, accurate, and scalable solution for MHT-CET admission support. Its success opens doors for future advancements like AI-guided counseling, voice assistant integration, and use in other state-level or national entrance exams. The system not only meets current needs but also sets the stage for future intelligent educational support platforms.

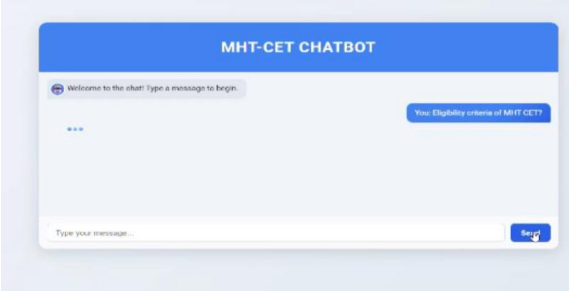
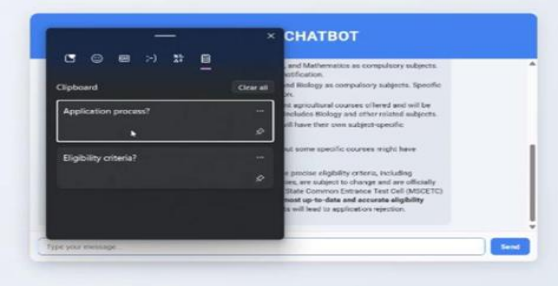


Fig. 3.



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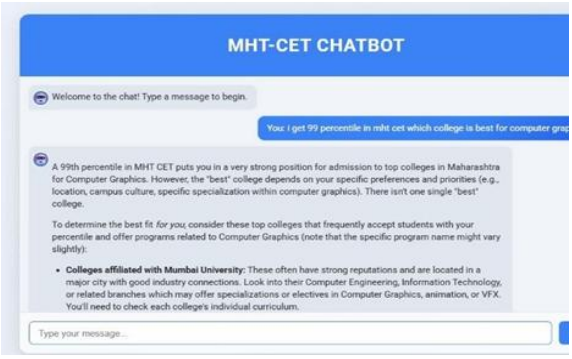

Fig. 5.

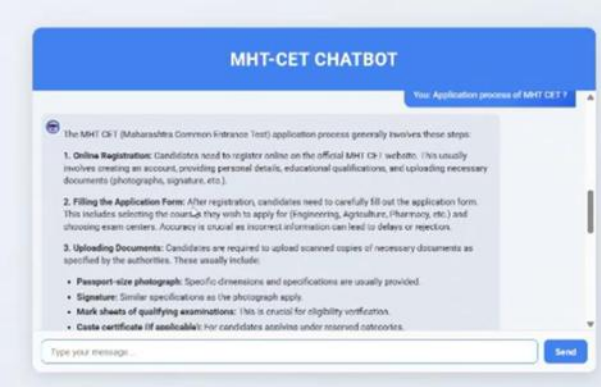

Fig. 6.

V. CONCLUSION

The combination of Artificial Intelligence (AI), Natural Language Processing (NLP), and mobile technologies in the AI-powered Student Assistance Chatbot for MHT- CET admissions has significantly changed how students navigate the complicated admission process. By providing automated responses, real-time updates, and personalized guidance, the system effectively reduces confusion and delays that students often face. The chatbot offers 24/7 access to reliable information about eligibility criteria, required documents, cutoff trends, CAP rounds, and college selection, all through an easy- to-use interface.

The proposed system improves user interaction and satisfaction while boosting institutional efficiency by lessening administrative tasks. Its strong query-handling ability ensures it can grow and adjust as needed. With support for multiple languages and seamless integration with official admission portals, it makes access easier for rural and non-English-speaking students.Future work will focus on adding more AI features to the chatbot, such as predictive analytics, voice recognition, and the ability to connect with digital academic records. These features can help forecast admission trends, provide career advice, and offer post-admission services like fee payment and orientation scheduling.

In summary, the AI-powered Student Assistance Chatbot sets a standard for technology-driven academic support. It connects students and institutions while providing a safe, scalable, and smart solution that fits the vision of modern education systems and digital governance in India.

VI. FUTURE SCOPE

The AI-Powered Student Support Chatbot for Admission via MHT-CET has great potential for future growth. Improvements in Artificial Intelligence (AI) and Natural Language Processing (NLP) can lead to more personalized, adaptive, and context-aware interactions. Machine learning models trained on past admission data could predict common questions, suggest institutions based on performance metrics, and help candidates navigate CAP rounds and documentation accurately.

We expect integration with state-level e-Governance platforms and educational websites. This will provide real-time updates on results, cutoff scores, and document verification schedules. Voice-based and multilingual interfaces can improve access,especially for students in rural areas, by using speech-to-text and recognizing regional languages.For security, blockchain-based data storage and advanced authentication methods, such as biometric and Aadhaar-based verification, can ensure safe handling of sensitive student records. The system could also expand to offer career counseling, mental health support, and scholarship recommendations, going beyond just admissions.

Cloud-enabled scalability will allow this system to be deployed at both state and national levels, integrating with virtual learning environments, exam preparation tools, and educational analytics dashboards. Eventually, the chatbot could become a fully automated virtual counselor, supporting students from application to enrollment. This would transform the admission process into a smarter, more efficient, and fair experience.

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